

Amendments to the Claims :

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-3 (Canceled)

4. (Currently amended) A biochip comprising an array of individually driven microelectrodes, each connected to a single cell, comprised on a suitable insulating layer mounted on a solid substrate; means to electrically connect said microelectrodes to a switching system; a cell culture chamber where cells can be grown and adhere in contact with said array of microelectrodes on a surface formed by said insulating layer containing said array of microelectrodes on said solid substrate.

5. (Previously presented) The biochip according to claim 4 comprising a semiconductor substrate as the solid substrate covered with an insulating layer comprising said array of individually driven microelectrodes of a size comparable to the cell to be electroporated, and mounting a cell culture chamber with an opening mounted, in turn, on a support made of dielectric material, said microelectrodes being electrically connected via conductive traces to conductive pads electrically connected, in turn, to a couple of external parallel connectors through wire bonding covered by an outer portion of the cell culture chamber encircling the opening, being said cell culture chamber with the opening mounted over the top of said semiconductor substrate covered with the insulating layer, both attached on the dielectric support.

6. (Previously presented) A biochip according to claim 5 comprising two further electrodes integrated in the semiconductor substrate covered with the insulating layer, and acting as a ground reference.

7. (Previously presented) A biochip according to claim 5 wherein the semiconductor substrate covered with the insulating layer is a silicon substrate covered with an insulating layer preferentially of SiO₂.
8. (Previously presented) The biochip according to claim 5 wherein the solid substrate is transparent.
9. (Previously presented) The biochip according to claim 5 wherein the dielectric support is vetronite, glass or ceramic.
10. (Previously presented) The biochip according to claim 5 wherein the microelectrodes of the array have a size with a surface of at least ten per cent of the total cell membrane and preferably a diameter ranging from 1 µm to 50 µm.
11. (Previously presented) The biochip according to claim 4 wherein the microelectrodes are of conductive or capacitive type.
12. (Thrice amended) The biochip according to claim 11 ~~consisting of~~ comprising conductive microelectrodes obtained over a silicon substrate covered with an insulating layer preferentially of SiO₂, said microelectrodes having connecting traces wherein said microelectrodes and their connecting traces being made by a "sandwich" of two titanium nitride, TiN, layers and an aluminium layer, covered with a gold layer on their active surface.
13. (Previously presented) The biochip according to claim 11 wherein said microelectrodes are realized using Metal Oxide Semiconductor, MOS, technology.
14. (Thrice amended) The biochip according to claim 13 ~~consisting of~~ comprising a silicon p-type substrate in which two n-doped regions, a drain and a source, are implanted with conventional microelectronic techniques, the microelectrodes further comprising a gate, wherein the a gate of these electrodes is ~~being realized in~~ n+ doped polysilicon and common to all devices in a row, word line, the drain of all devices in a column being connected together by using a metal contact plug and a metal line, the source of the resulting transistor being connected via a metal, usually

tungsten, plug to a gold layer which acts as the active electrode.

15. (Previously presented) The biochip according to claim 11 wherein the microelectrodes consist of a capacitive microelectrode obtained with an insulating substrate, a metal and a thin insulating layer said microelectrodes being separated by insulating material and covered in non exposed areas by a passivation layer.

16-26 (Canceled)